



## **Relative Safety of Weightlifting for Youth**

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A compelling body of evidence indicates that appropriately supervised and well-designed resistance training programs can be safe and beneficial for children and adolescents. Yet there remains concern among some parents, coaches and school administrators that selected exercises may be potentially injurious for school-age youth. Of note, the relative safety of weightlifting movements (e.g., snatch and clean and jerk) and modified cleans, pulls and presses have been questioned by some observers.

### **Are Weightlifting Movements Safe for Youth?**

Lifts such as the snatch and the clean and jerk are explosive but highly controlled movements that require a high degree of technical skill. In the snatch lift the barbell is lifted from the platform to arms length overhead in a single continuous movement and in the clean and jerk the barbell is lifted from the platform to the shoulders and then to the overhead position to complete the two-part lift. While these lifts involve more complex neural activations patterns than other resistance exercises, the belief that properly performed weightlifting movements are riskier than other sports and activities is not consistent with research findings.

With qualified instruction and safety measures in place (e.g., safe lifting environment, appropriate loads), data indicate that risk of injury during the performance of a weightlifting movement during training or competition is relatively low. For example, Hamill evaluated injury rates in adolescents who participated in a variety of sports and concluded that weightlifting was markedly safer than other sports including soccer and rugby. In support of these findings, Byrd et al. and Pierce et al. evaluated the incidence of injury in young lifters and concluded that competitive weightlifting is safer than generally thought provided that age-appropriate training guidelines are followed and competent coaching is available. To date, no scientific evidence indicates that properly performed and sensibly progressed weightlifting movements performed during practice or competition are riskier than other sports and activities in which youth regularly participate.

While these findings may be surprising to some observers, it is important to emphasize that the coordination and skill technique needed to learn these lifts correctly requires a light weight barbell or a wooden dowel. Unlike an exercise such as the bench press whereby a beginner may attempt to perform this lift with a moderate to heavy load, weightlifting movements such as the snatch can only be learned with a light load. Once youth develop the skill, technique and confidence to perform these lifts correctly, the training intensity and volume can be gradually increased.

### **Program Design Considerations**

Weightlifting movements do not need to be incorporated into all youth strength training programs. However, boys and girls who want to learn these lifts under the supervision of a qualified coach may benefit from this type of training provided the focus remains on learning proper exercise technique with appropriate loads. Coaches should be aware of the considerable amount of time it takes to teach these lifts and should be knowledgeable of the progression from basic exercises (e.g., front squat) to skill transfer exercises (e.g., overhead squat) and finally to the competitive lifts (e.g., snatch). Although there is no minimum age requirement for performing weightlifting movements, participants should have the emotional maturity to accept and follow directions and should be aware that they could get hurt if they do not follow coaching instructions.

All youth resistance training programs should include proper instruction, qualified supervision, correct exercise technique, a safe training environment and a gradual advancement from education, to progression to function. If age-specific training guidelines are followed and if coaches are viewed as knowledgeable and enthusiastic, the performance of weightlifting movements can be a safe, enjoyable and beneficial experience for children and adolescents. Our three-phase approach for teaching weightlifting to children and adolescents is outlined below:

**Phase 1: Education.** The purpose of phase one is to introduce all students to proper exercise technique, general resistance training guidelines and safety procedures. For example, during this time we focus on developing proper exercise technique with a

wooden dowel or lightweight medicine ball (one to two kg) and we teach proper safety procedures which include practicing how to ‘miss’ a lift.

**Phase 2: Progression.** As youth gain confidence and competence in their abilities to perform weightlifting movements, participants progress from a wooden dowel or medicine ball to a lightweight (7 kg) aluminum barbell and then to a lightweight barbell with plastic training plates (2 kg). Once movement competency is established, basic weightlifting movements can be incorporated into a periodized training program which includes the snatch and the clean and jerk.

**Phase 3: Function.** During phase three program variables such as exercises, sets, repetitions, and rest periods are individually prescribed to keep the program safe, challenging and effective. As the program is progressed with heavier loads (e.g., 70 to 80% maximum), coaches should not overlook the value of reinforcing proper exercise technique with less intense training cycles which are needed during long term athletic training programs. In addition, youth coaches can minimize the risk of injury by ensuring a safe training environment, limiting the number of heavy lifts during a workout and allowing for adequate recovery between training sessions.

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